

TECHNICAL REPORT

RAPPORT TECHNIQUE

**Fire hazard testing –
Part 8-2: Heat release – Summary and relevance of test methods**

**Essais relatifs aux risques du feu –
Partie 8-2: Dégagement de chaleur – Résumé et pertinence des méthodes
d'essais**



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INTERNATIONAL ELECTROTECHNICAL COMMISSION

FIRE HAZARD TESTING –**Part 8-2: Heat release –
Summary and relevance of test methods**

FOREWORD

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The main task of IEC technical committees is to prepare International Standards. However, a technical committee may propose the publication of a technical report when it has collected data of a different kind from that which is normally published as an International Standard, for example "state of the art".

IEC 60695-8-2, which is a technical report, has been prepared by IEC technical committee 89: Fire hazard testing.

This second edition cancels and replaces the first edition of IEC 60695-8-2/TS published in 2000 and constitutes a technical revision.

The main changes with respect to the previous edition are listed below:

- editorial changes throughout;

- revised terms and definitions;
- introduction of a new Subclause 4.1.1 – Bomb calorimeter;
- introduction of a new Table 1 dealing with vertical ladder tests;
- introduction of a new Subclause 4.2.4 – SBI test method;
- introduction of a new Subclause 4.2.6 – Open calorimetry fire tests.

It has the status of a basic safety publication in accordance with IEC Guide 104 and ISO/IEC Guide 51.

This technical report is to be used in conjunction with IEC 60695-8-1.

The text of this technical report is based on the following documents:

Enquiry draft	Report on voting
89/808/DTR	89/830A/RVC

Full information on the voting for the approval of this technical report can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all the parts in the IEC 60695 series, under the general title *Fire hazard testing*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the maintenance result date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

INTRODUCTION

In the design of any electrotechnical product, the risk of fire and the potential hazards associated with fire need to be considered. In this respect the objective of component, circuit and equipment design as well as the choice of materials is to reduce to acceptable levels the potential risks of fire even in the event of foreseeable abnormal use, malfunction or failure. IEC 60695-1-10 [1]¹⁾, together with its companion, IEC 60695-1-11 [2], provide guidance on how this is to be accomplished.

The primary aims are as follows:

- 1) to prevent ignition caused by an electrically energized component part, and
- 2) in the event of ignition, to confine any resulting fire within the bounds of the enclosure of the electrotechnical product.

Secondary aims include the minimization of any flame spread beyond the product's enclosure and the minimization of harmful effects of fire effluents including heat, smoke and toxic or corrosive combustion products.

Fires involving electrotechnical products can also be initiated from external non-electrical heat sources. Considerations of this nature are dealt with in the overall risk assessment.

Fires are responsible for creating hazards to life and property as a result of the generation of heat (thermal hazard), toxic and/or corrosive compounds and obscuration of vision due to smoke. Fire risk increases as the heat released increases, possibly leading to a flash-over fire.

One of the most important measurements in fire testing is the measurement of heat release and it is used as an important factor in the determination of fire hazard; it is also used as one of the parameters in fire safety engineering calculations.

The measurement and use of heat release data, together with other fire test data, can be used to reduce the likelihood of (or the effects of) fire, even in the event of foreseeable abnormal use, malfunction or failure of electrotechnical products.

When a material is heated by some external source, fire effluent can be generated and can form a mixture with air which can ignite and initiate a fire. The heat released in the process is carried away by the fire effluent-air mixture, radiatively lost or transferred back to the solid material, to generate further pyrolysis products, thus continuing the process.

Heat may also be transferred to other nearby products, which may burn, and then release additional heat and fire effluent.

The rate at which thermal energy is released in a fire is defined as the heat release rate. Heat release rate is important because of its influence on flame spread and on the initiation of secondary fires. Other characteristics are also important, such as ignitability, flame spread and other side effects of the fire (see the IEC 60695 series of standards).

1) Figures in square brackets refer to the bibliography.

FIRE HAZARD TESTING –

Part 8-2: Heat release – Summary and relevance of test methods

1 Scope

This part of IEC 60695 presents a summary of published test methods that are relevant to determine heat release for electrotechnical products. It represents the current state of the art of the test methods and, where available, includes special observations on their relevance and use. The list of test methods is not to be considered exhaustive, and test methods which were not developed by IEC/TC 89 are not to be considered as endorsed by IEC TC89 unless this is specifically stated.

Heat release data can be used as part of fire hazard assessment and in fire safety engineering, as discussed in IEC 60695-1-10 [1] and IEC 60695-1-11 [2].

This basic safety publication is intended for use by technical committees in the preparation of standards in accordance with the principles laid down in IEC Guide 104 and ISO/IEC Guide 51.

One of the responsibilities of a technical committee is, wherever applicable, to make use of basic safety publications in the preparation of its publications. The requirements, test methods or test conditions of this basic safety publication will not apply unless specifically referred to or included in the relevant publications.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60695-4:2005, *Fire hazard testing – Part 4: Terminology concerning fire tests for electrotechnical products*

IEC 60695-8-1:2001, *Fire hazard testing – Part 8-1: Heat release – General guidance*

IEC Guide 104:1997, *The preparation of safety publications and the use of basic safety publications and group safety publications*

ISO/IEC Guide 51:1999, *Safety aspects – Guidelines for their inclusion in standards*

ISO/IEC 13943:2000, *Fire safety – Vocabulary*